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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,171	12/03/2003	Takayuki Mizuno	14321.60	5976
22913	7590	06/17/2005	EXAMINER	
WORKMAN NYDEGGER (F/K/A WORKMAN NYDEGGER & SEELEY) 60 EAST SOUTH TEMPLE 1000 EAGLE GATE TOWER SALT LAKE CITY, UT 84111			STEIN, JAMES D	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/727,171		MIZUNO ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	James D. Stein		2874	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 17-20, 29-32, 35-38, 40, 42, 48, 50, 53 and 56 is/are rejected.
- 7) ☒ Claim(s) 9-16, 21-28, 33, 34, 39, 41, 43-47, 49, 51, 52, 54 and 55 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12-03-03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____   |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1204,0904,0404</u> .  | 6) <input type="checkbox"/> Other: ____                                     |

## DETAILED ACTION

### *Claim Objections*

Claims 9-12 are objected to because the reference to symbols ( $\Theta$ ,  $\delta 1$ ,  $\delta L$ ,  $\Psi$  and  $\Phi$ ) renders the claims indefinite. For clarity, the claims should be amended to recite the specific values or equations associated with the variables as taught in the specification.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8, 17-20, 48 and 56 are rejected under 35 U.S.C. 102(e) as being anticipated by [USPAT 6,882,772 / WO9945420] to Lowery et al.

With regard to claim 1, Lowery et al. disclose a related optical MUX/DMUX dispersion compensation device (abstract) comprising: an optical multi/demultiplexing device 2 including at least one input section 4 and a plurality of output sections 8; an optical delay line device 12 connected to the optical multi/demultiplexing device; and at least one phase generating device 6, wherein said phase generating device 6 generates a phase corresponding to a wavelength (abstract) or frequency of light in a passband of said optical multi/demultiplexing circuit 2 (see description, col. 3 line 18 – col. 4 line 10).

With regard to claim 2, in addition to the rejection of claim 1 previously discussed above, as shown by Fig. 1, the phase generating device 6 is installed in the optical multi/demultiplexing device 2.

With regard to claims 3 and 4, in addition to the rejections of claims 1 and 2 previously discussed above, Lowery et al. teach the phase generated by said phase generating device is given by a function of a wavelength  $\lambda$  of light in a transmission wavelength band of said optical multi/demultiplexing circuit that is a quadratic function (see description, col. 3 line 35- col. 4 line 10).

With regard to claims 5-8, in addition to the rejection of claims 1-4 previously discussed above, Lowery teaches that the optical couplers 6 and 10 connected to the delay lines 12 function so as to produce the phase shift (abstract and col. 2 line 25 – col. 3 line 34).

With regard to claims 17-20, in addition to the rejections of claims 2, 3, 6, and 8 previously discussed above, fig. 1 of Lowery et al. shows  $N=1$  optical delay line portion (12) for every  $N+1=2$  multi/demultiplexing devices (6 and 10). Furthermore, the delay line portion 12 is interposed between adjacent two of the optical multi/demultiplexing devices 6 and 10 as shown by Fig. 1. It is noted to applicant that the overall device 2 is an interferometer.

With regard to claim 48, in addition to the rejection of claim 5 previously discussed above, because the optical delay line 12 introduces a wavelength dependent group delay (abstract), it inherently comprises a birefringent adjustment device, as claimed by applicant. A wavelength dependent delay is, in fact, the definition of birefringence.

With regard to claim 56, in addition to the rejection of claim 1 previously discussed above, Lowery et al. teach that the output of the first multi/demultiplexing device may be

connected to the input of a second demultiplexing device in order to further compensate for dispersion (col. 6 lines 6-23).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lowery et al. as applied to claims 2, 4, 6 and 8 previously discussed above, and further in view of [USPAT 6,856,724] to Bohn et al., which discloses a related optical MUX device with dispersion compensation. Lowery et al. disclose the claimed invention except for the optical multi/demultiplexing device to consist of a transversal-form filter. Bohn et al. teach that a transversal filter may be employed in order to compensate for dispersion in all channels of a WDM system simultaneously; therefore reducing the complexity of the system (col. 1 lines 35-45). Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art to modify the device as taught by Lowery et al. to include a transversal-form filter in order to compensate for dispersion in all channels of the system simultaneously and reduce the complexity of the system.

Claim 35-38, 40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lowery as applied to claims 1-4, 20 and 32 previously discussed above, and further in view of [USPUB 20020044742] to Yoneda, which discloses a related arrayed waveguide grating device.

Lowery et al disclose the claimed invention except for light waves to be received or emitted by slab waveguides and the arrayed waveguide grating includes waveguides having their first ends connected to the first slab waveguide 69 and their second ends connected to the second slab waveguide. Fig. 5 shows light waves to be received or emitted by slab waveguides 69 and 71. The arrayed waveguide grating includes waveguides having their first ends connected to the first slab waveguide 69 and their second ends connected to the second slab waveguide 71. Therefore, it would have been obvious at the time of the invention to one of ordinary skill in the art to modify the invention as disclosed by Lowery et al. to include first and second slab waveguides as taught by Yoneda in order to facilitate an increased number of output-side channels or to provide a monitoring output terminal (abstract).

Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lowery et al. as applied to claim 1 above, and further in view of Applicant's admitted prior art [EP 0 382 461] to Kawachi et al. Lowery et al. disclose the claimed invention except for the multi/demultiplexing device to be composed of silica-based glass optical waveguides. Apart from silica-based glass optical waveguides being the most well-known optical waveguides in the art, Kawachi et al. teaches the optical waveguides to be made from silica glass (page 5, line 10). It would have been obvious at the time of the invention to one of ordinary skill in the art construct the device disclosed by Lowery et al. from silica based optical waveguides in order to effectively guide and couple the light signals.

Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lowery et al. as applied to claim 1 above, and further in view of [USPUB 20040008927] to Kowalkowski et al. Lowery et al. disclose the claimed invention except for the multi/demultiplexing device to be

Art Unit: 2874

installed in a casing, having optical fibers held by the casing carry out input and output of an optical signal to and from the multi/demultiplexing device. Kowalkowski discloses a multiplexing device wherein the multiplexing device is held in a housing and the optical fibers are connected thereto in order to facilitate interconnection to a host device or system [0009]. Therefore, it would have been obvious at the time of the invention to modify the device as disclosed by Lowery et al. such that the multi/demultiplexing device is installed in a casing, having optical fibers held by the casing carry out input and output of an optical signal to and from the multi/demultiplexing device in order to protect the device and facilitate interconnection to a host device or system.

***Allowable Subject Matter***

Claims 9-16, 21-28, 33-34, 39, 41, 43-47, 49, 51, 52, 54, 55 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the cited prior art discloses or suggests the multi/demultiplexing circuit as discussed above wherein in an amplitude coupling ratio  $\Theta$  of said optical coupler, and an optical path length difference  $\delta l$  of said optical delay line of said phase generating device and an optical path length difference  $\delta L$  provided to said optical delay line device in said optical multi/demultiplexing circuit are each optimized such that said phase generating device generates the phase  $\Phi$  equal to a correct phase  $\Psi$ , and  $f$  functions as an optical coupler with an amplitude coupling ratio  $\Theta$ .

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: [USPAT 6,711,313] to Takaguchi et al. and [USPAT 6,892,021] to Doerr, which disclose related optical multi/demultiplexing devices with phase delay components.

The references cited on the Information Disclosure Statements filed on 12/21/04, 9/8/04, and 4/2/04 have been considered.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

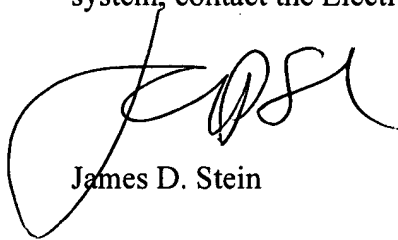
Any inquiry concerning this communication or earlier communications from the examiner should be directed to James D. Stein whose telephone number is (571) 272-2132. The examiner can normally be reached on M-F (8:00am-4:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

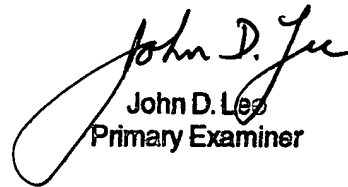


Art Unit: 2874

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



James D. Stein



John D. Lee  
Primary Examiner